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EG&G ISC **ISC-ES-06 73 01.00 99 (January 2009)**

Preparing Activity: EG&G ISC-ES **Superseding SGS-06 81 33.00 99 March 2006)**

EG&G ISC GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2008
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DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

SECTION 06 73 01.00 99

FIBERGLASS REINFORCED PLASTIC (FRP) GRATING

01/09

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SECTION 06 73 01.00 99

FIBERGLASS REINFORCED PLASTIC (FRP) GRATING
01/09

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NOTE: This guide specification covers requirements for fiberglass reinforced plastic (FRP) gratings.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification at ISC-ES.
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NOTE: Units of work normally included in this section should be FRP items which require specific fabrication to meet the desired project requirements.
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NOTE: Show the following information on the drawings:

1. Location and configuration of all FRP grates.

2. All sizes and dimensions.

3. Special fastenings, attachments or anchoring.

4. Location and special details of expansion joint covers.

5. Connection details, other than manufacturer's standard of grating.

8. Locate and detail removable sections of handrails.

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PART 1 GENERAL

1.1 SUMMARY

This Section includes, but is not limited to, new fiberglass reinforced plastic (FRP) grating for elevated platforms and walkways.

1.2 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of the Project Specifications and are a component to the requirements for the work contained in this Section.

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE/SEI 7-05	(2006) Minimum Design Loads for Buildings and Other Structures, Including Supplement No. 1

ASTM INTERNATIONAL (ASTM)

ASTM B 633	(2007) Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
ASTM D 635	(2006) Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
ASTM E 84	(2008a) Standard Test Method for Surface Burning Characteristics of Building Materials

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance of Gratings: Provide gratings capable of

withstanding the effects of gravity loads in accordance with ASCE/SEI 7-05 and Florida Building Code and the following loads and stresses within limits and under conditions indicated:

1. Walkways and Elevated Platforms Other Than Exits: Uniform load of 60 lbf/sq.ft.

2. Walkways and Elevated Platforms Used as Exits: Uniform load of 100 lbf/sq.ft.

1.4 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

SD-03 Product Data

Manufacturer's catalog data to include two copies of manufacturer's specifications, load tables, dimension diagrams, and anchor details for the following items:

FRP Grating
Clips and Anchorage for FRP Grating

SD-06 Test Reports

Ultraviolet Testing
Thermal Expansion
Flame Spread

SD-07 Certificates

Manufacturer's Sample Warranty
Manufacturer's Certification of Ultraviolet Testing
Manufacturer's Certification of Florida Product Approval
Certification of Anchorage System compliance with ASCE/SEI 7-05, 2005, and all other pertinent structural design data, corrosion resistance tables, test reports as applicable
Proof of Certification from a minimum of two quality assurance programs for its facilities or products (UL, DNV, ABS, USCG, AARR)

SD-08 Manufacturer's Instructions

Manufacturer's recommendations for shipping, handling, erection procedures, and care and maintenance upon completion of installation.

SD-09 Manufacturer's Field Reports

Manufacturer's Certification of Installation

SD-11 Closeout Submittals

Manufacturer's Warranty

1.5 QUALITY ASSURANCE

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NOTE: For jobs in Iceland, in lieu of AWS welders and inspectors, use "Technological Institute of Iceland" certified welders and inspectors.
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A. Furnish items by manufacturers having a minimum of ten (10) years experience in the design and manufacture of similar products and systems. Additionally, if requested, provide a record of at least five (5) previous, separate, similar successful installations in the last five (5) years.

B. Provide three (3) year manufacturer's limited warranty on all FRP products against defects in materials and workmanship.

C. Manufacturer to be certified to the ISO 9001-2000 standard.

1.6 PRODUCT DELIVERY AND STORAGE

A. Deliver manufactured materials in original, unbroken pallets, packages,

containers, or bundles bearing the label of the manufacturer. Adhesives, resins and their catalysts and hardeners to be crated or boxed separately and noted as such to facilitate their movement to a dry indoor storage facility.

B. Carefully handle all materials to prevent them from abrasion, cracking, chipping, twisting, other deformations, and other types of damage. Adhesives, resins and their catalysts are to be stored in dry indoor storage facilities between 70 and 85 degrees Fahrenheit until they are required.

PART 2 PRODUCTS

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NOTE: Product selections should be based on esthetic values, reliability and cost. Delete alternate requirements where they occur.
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2.1 PRODUCT REQUIREMENTS

All gratings are to be composed of fiberglass reinforcement and resin in qualities, quantities, properties, arrangements and dimensions as necessary to meet the design requirements and dimensions as specified.

Fiberglass reinforcement to be continuous roving in sufficient quantities as needed by the application and/or physical properties required.

Provide resin of isophthalic polyester with chemical formulations as necessary to provide the corrosion resistance, strength and other physical properties as required. Submit documentation for ultraviolet testing and testing for thermal expansion.

All finished surfaces of FRP items and fabrications to be smooth, resin-rich, free of voids and without dry spots, cracks, and un-reinforced areas. Completely cover all glass fibers with resin to protect against their exposure due to wear or weathering.

Provide grating products with a flame spread rating of 25 or less per ASTM E 84 Tunnel Test. Test gratings for burn time of less than 30 seconds and an extent of burn rate of less than or equal to 10 millimeters per ASTM D 635.

2.1.1 Molded FRP Grating

Grating to be (1) one piece molded construction with tops and bottoms of bearing bars and cross bars in the same plane with a rectangular mesh pattern providing unidirectional strength and reinforced with continuous roving of equal number of layers in each direction. The top layer of reinforcement to be no more than 1/8" below the top surface of the grating to provide maximum stiffness and prevent resin chipping of unreinforced surfaces having percentage of glass (by weight) not exceed 35% so as to achieve maximum corrosion resistance, and as required to maintain the structural requirements.

After molding, no dry glass fibers to be visible on any surface of bearing bars or cross bars. All bars to be smooth and uniform with no evidence of fiber orientation irregularities, inter-laminar voids, porosity, resin rich or resin starved areas.

Non-slip surfacing to be manufactured with a concave, meniscus profile on the top of each bar providing maximum slip resistance.

Grating bar intersections are to be filleted to a minimum radius of 1/16" to eliminate local stress concentrations and the possibility of resin cracking at these locations.

Grating to be fire retardant with a tested flame spread rating of 25 or less when tested in accordance with ASTM E 84.

2.1.2 Fasteners

General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners, clips and anchorage, for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

2.2 GRATING FABRICATION

Verify measurements in field for work fabricated to fit field conditions as required by grating manufacturer to complete the work.

All field and shop fabricated grating cuts to be coated with vinyl ester resin to provide maximum corrosion resistance in accordance with the manufacturer's instructions.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Install items at locations indicated, according to manufacturer's instructions.[Submit [_____] copies of manufacturer's certification of installation to the Contracting Officer.] Verify all measurements and take all field measurements necessary before fabrication. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, to be included. Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack. Comply with recommendations of referenced bar grating standards, including installation clearances and standard anchoring details.

a. Attach removable units to supporting members with type and size of clips and fasteners indicated or, if not indicated, as recommended by grating manufacturer for type of installation conditions shown.

b. Attach nonremovable units to supporting members by welding where both materials are same; otherwise, fasten by bolting as indicated above.

3.2 ANCHORAGE, FASTENINGS, AND CONNECTIONS

Provide anchorage where necessary for fastening miscellaneous FRP items securely in place. Include for anchorage not otherwise specified or indicated.

3.3 MANUFACTURER'S WARRANTY

Submit original and [_____] copies of manufacturer's signed Warranty.

-- End of Section --